Supporting Information for

Reduced graphene oxide anchoring $CoFe_2O_4$ nanoparticles as effective catalyst for non-aqueous Lithium oxygen batteries

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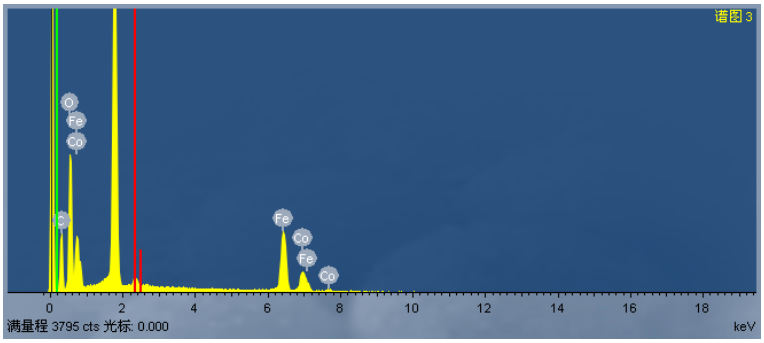
The synthesis of graphene oxide (GO)

Graphene oxide (GO) was prepared by the modified Hummers' method. Typically, a mixture of expanded graphite (0.5 g), $NaNO_3$ (0.5 g), $KMnO_4$ (3g) was added into H_2SO_4 (98%, 60 mL) and the solution was kept in magnetic stirring for 12 h at room temperature. The obtained sticky green solution was slowly poured into ~ 400 mL deionized water with continuous stirring. Then, 30% H_2O_2 was added into the above solution drop by drop until the color of the solution turned from crimson to orange. The solution was cool down and was then centrifuged and washed with water for three times. The final brown homogeneous gel was GO.

Synthesis of $CoFe_2O_4$/rGO hybrid

The CoFe2O4/rGO hybrid was synthesized by the solvothermal reaction of $Co^{2+}$and Fe^{2+} in N,N-dimethylformamide (DMF) in the presence of GO. Firstly, 0.8 g P123 (EO20PO70EO20, Mw=5800 g•mol^{-1}) was added to 100 mL DMF with vigorous stirring for 30 min. Then 25 mL GO aqueous (0.05 g) was dispersed in the DMF solution with stirring for 15min. Subsequently, 1.5 mmol $CoCl_2$•$6H_2O$ and 3.0 mmol $FeCl_2$•$4H_2O$ was added to the mixture solution. Then, the mixture was sealed in a Teflon-lined stainless steel autoclave for solvothermal reaction at 180 □for 4 h. Next the precipitate was washed several time with water and ethanol, and then dried at 60□ for 12h to obtain the procedures. Finally, the precursors were heated at 300□ for 4 h under N_2 protection with a heating rate of 5 □•min^{-1} in a tube furnace to obtain the resultant products.



element	Mass content (%)	Atomic content (%)
C K	17.18	35.86
O K	24.51	38.42
Fe L	38.42	17.25
Co L	19.89	8.46

Fig. S1 Energy dispersive X-ray spectrometry (EDS) results of the $CoFe_2O_4$/rGO hybrid.

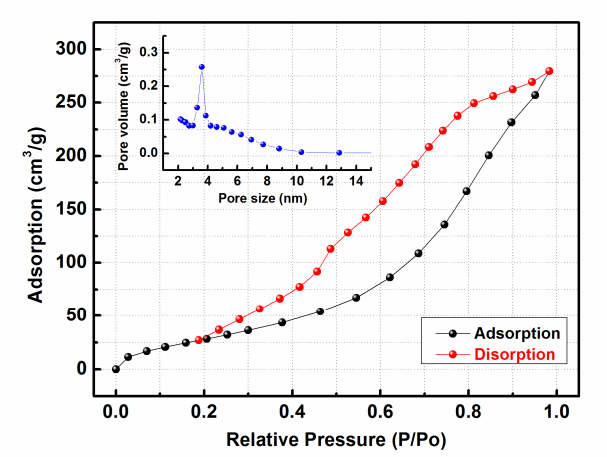


Fig. S2 N_2 adsorption-desorption isotherm and the pore-size distribution of the $CoFe_2O_4$/rGO hybrid confirmed by BJH desorption isotherms.